

Appl. No. 09/654,087
Amendment dated November 2, 2004
Reply to Office Action of August 2, 2004

REMARKS

Claims 1-4 and 7-18 are pending in this application. For purposes of expedition, claims 5-6 have been canceled without prejudice or disclaimer. Claims 1 and 13 have been amended to clarify the relationship between a package case, a pipe-line support member projecting from a side face of the package case, and an inline optical isolator member, while claims 17-18 have been newly added, in accordance with current Office policy, to alternatively define Applicants' disclosed invention relative to cited prior art of record. Claims 14-16 have been amended to ensure proper antecedent basis for several terms defined in base claim 13.

Claims 1, 5-7 and 11-13 have been rejected under 35 U.S.C. §102(b) as being anticipated by Driessen, European Patent Application No. 0 501 571 for reasons stated on pages 2-3 of the Office Action (Paper No. 14). However, Applicants submit that key features of Applicants' base claims 1 and 13 are not disclosed or suggested by Driessen '571. Therefore, Applicants respectfully traverse and request the Examiner to reconsider and withdraw this rejection for reasons discussed herein below.

First of all, base claims 1 and 13 have been amended, for purposes of expedition, to clarify the relationship between a package case, a pipe-line support member projecting from a side face of the package case, and an inline optical isolator member, as shown, in FIG. 1. Specifically, claim 1, as amended, defines an optical transmitter module comprising:

- an optical semiconductor element;
- an inline optical isolator member comprising an optical isolator, a first optical fiber disposed on a side face of said optical isolator and facing to said optical semiconductor element, and a second optical fiber disposed on another side of said optical isolator and communicating to outside;

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a package case containing said optical semiconductor element;
a thermoelectric cooler provided in said package case;
a substrate member mounted on the thermoelectric cooler, in
said package case; and
a pipe-like support member projecting from a side face of said
package case,
wherein said inline optical isolator member is introduced from
said pipe-like support member into said package case,
wherein said first optical fiber is fixed at a distal end to said
substrate member so as to optically couple to said optical
semiconductor element, and
wherein said optical isolator has an area fixed in said pipe-like
support member, said area being jointed on its whole perimeter to a
distal end of said pipe-like support member so as to be fixed to said
pipe-like support member.

Similarly, base claim 13, as amended, defines an optical transmitter module,
comprising:

a package case comprising a pipe-like support member
projecting from a side face thereof;
a thermoelectric cooler positioned inside the package case;
a substrate mounted on the thermoelectric cooler inside the
package case;
an optical semiconductor element disposed on the substrate;
an inline optical isolator member comprising an optical isolator,
a first optical fiber disposed on one side of the optical isolator facing
the optical semiconductor element, and a second optical fiber disposed
on the other side of the optical isolator,
wherein the inline optical isolator member is introduced into the
package case, from the pipe-like support member, via the side face of
the package case, such that the first optical fiber is secured on the
substrate and optically coupled to the optical semiconductor element;
and
wherein the optical isolator is joined on its whole perimeter to
the pipe-like support member at a distal end thereof so as to be fixed to
the pipe-like support member.

As expressly defined in Applicants' base claims 1 and 13, the inline optical
isolator member structure (module) is incorporated into the package case, as
described on page 9, lines 6-18, page 10, line 9 extending to page 11, line 4 of
Applicants' original specification. The inline optical isolator member includes an

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optical isolator integrally formed between front and rear optical fibers, and is inserted into the package case and fixed thereto. As a result, when the distal end position of the first optical fiber is adjusted in order to optically couple to the optical semiconductor element with high accuracy, the optical isolator coupled to the first optical fiber moves in the pipe-like support member correspondingly to the adjustment. Therefore, by fixing the optical isolator in the pipe-like support member, operations such as positional adjustments on an optical coupling path between package members can be excluded so as to assemble the optical transmitter module with high productivity.

Moreover, since the pipe-like support member is projected from a side face of the package case the optical isolator has an area fixed in the pipe-like support member ... being joined on its whole perimeter to a distal end of the pipe-like support member, the heat generated from the optical semiconductor element can be efficiently removed, and even if the heat deformation is caused in the package case or the like and the external force is applied due to the heat deformation, the optical fiber can be stably assembled to the substrate member so as to prevent the efficiency in the optical fiber from deterioration. Therefore, the semiconductor laser element can provide a stable laser operation.

Furthermore, since the optical isolator is now mounted in the pipe-like support member, and **not** on the substrate member, the load imposed on the thermoelectric cooler can be made smaller, and the heat capacity can now be controlled by the electronic cooling element to the substrate member mounted on the electronic cooling element and the elements mounted on the substrate member to be smaller than that to the substrate member, the elements and the optical isolator. Likewise,

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the heat generated from the semiconductor elements can now be efficiently removed. As a result, the heat influence to the ending of the optical fiber can be advantageously minimized, and stable laser transmission can be obtained.

In contrast to Applicants' base claims 1 and 13, Driessen '571 discloses an optical system (single package), as shown in FIG. 3, comprising two separate modules, i.e., a laser module 1 and an isolation module 22, which can be separately tested in advance of assembly, but can be eventually assembled, or mechanically and optically coupled simultaneously.

As shown in FIG. 1, the laser module 1 includes a first optical fiber 9 fixed to a substrate 11. The isolation module 22, as shown in FIG. 2, has an optical isolator 17 and a second optical fiber 20 disposed on one side of the optical isolator 17 in the tubular holder 16. As shown in FIG. 3, when the pipe-like member 12 of the laser module 1 is received in the isolation module 22 so as to combine the laser module 1 with the isolation module 22, the protruding part of the laser module 1 is contained in the above space within the holder 16 of the isolation module 22. One end of the first optical fiber 9 is positioned in the isolation module 22 so as to be optically joined to the optical isolator 17.

According to Driessen '571, the first optical fiber 9 is modularized with the optical semiconductor element. And, the second optical fiber 20 must be modularized with the optical isolator 17, separately from the laser module 1. As a result, it is impossible to form an inline optical isolator member provided with the first optical fiber and the second optical fiber on each of both sides of the optical isolator, and to insert the optical isolator member into the package so as to assemble the optical transmitter module, as expressly defined in Applicants' base claims 1 and 13.

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The rule under 35 U.S.C. §102 is well settled that anticipation requires that each and every element of the claimed invention be disclosed in a single prior art reference. In re Paulsen, 30 F.3d 1475, 31 USPQ2d 1671 (Fed. Cir. 1994); In re Spada, 911 F.2d 705, 15 USPQ2d 1655 (Fed. Cir. 1990). Those elements must either be inherent or disclosed expressly and must be arranged as in the claim. Richardson v. Suzuki Motor Co., 868 F.2d 1226, 9 USPQ2d 1913 (Fed. Cir. 1989); Constant v. Advanced Micro-Devices, Inc., 848 F.2d 1560, 7 USPQ2d 1057 (Fed. Cir. 1988); Verdegall Bros., Inc. v. Union Oil Co., 814 F.2d 628, 2 USPQ2d 1051 (Fed. Cir. 1987). The corollary of that rule is that absence from the reference of any claimed element negates anticipation. Kloster Speedsteel AB v. Crucible Inc., 793 F.2d 1565, 230 USPQ2d 81 (Fed. Cir. 1986).

The burden of establishing a basis for denying patentability of a claimed invention rests upon the Examiner. The limitations required by the claims cannot be ignored. See In re Wilson, 424 F.2d 1382, 165 USPQ 494 (CCPA 1970). All claim limitations, including those which are functional, must be considered. See In re Oelrich, 666 F.2d 578, 212 USPQ 323 (CCPA 1981). Hence, all words in a claim must be considered in deciding the patentability of that claim against the prior art. Each word in a claim must be given its proper meaning, as construed by a person skilled in the art. Where required to determine the scope of a recited term, the disclosure may be used. See In re Barr, 444 F.2d 588, 170 USPQ 330 (CCPA 1971).

In the present situation, Driessen '571 fails to disclose and suggest key features of Applicants' base claims 1 and 13, i.e., an inline optical isolator member provided with first and second optical fibers disposed on opposite sides of an optical

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Isolator, joined to an optical package mounting the optical semiconductor element.
Therefore, Applicants respectfully request that the rejection of claims 1, 5-7 and 11-13 be withdrawn.

Claims 2 and 4 have been rejected under 35 U.S.C. §103(a) as being unpatentable over Driessen, European Patent Application No. 0 501 571, in view of Timmerman, U.S. Patent No. 4,137,060 for reasons stated on pages 3-4 of the Office Action (Paper No. 14). Claim 4 has been rejected under 35 U.S.C. §103(a) as being unpatentable over Driessen, European Patent Application No. 0 501 571, in view of Eales et al., U.S. Patent No. 4,615,031 for reasons stated on pages 4-5 of the Office Action (Paper No. 14). Lastly claims 8-10 and 16 have been rejected under 35 U.S.C. §103(a) as being unpatentable over Driessen, European Patent Application No. 0 501 571, in view of Tatsuta et al., U.S. Patent No. 6,108,359 for reasons stated on page 5 of the Office Action (Paper No. 14). Since these rejections are predicated upon the correctness of the rejection of Applicants' base claims 1 and 13 under 35 U.S.C. §102(b), Applicants respectfully traverse these rejections primarily for the same reasons discussed against the rejection of Applicants' base claims 1 and 13.

Claims 17-18 have been newly added to alternatively define Applicants' disclosed invention over the prior art of record. These claims are believed to be allowable at least for the same reasons discussed against all the outstanding rejections of the instant application. No fee is incurred by the addition of claims 17-18.

In view of the foregoing amendments, arguments and remarks, all claims are deemed to be allowable and this application is believed to be in condition to be

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passed to issue. Should any questions remain unresolved, the Examiner is requested to telephone Applicants' attorney at the Washington DC area office at (703) 312-6600.

INTERVIEW:

In the interest of expediting prosecution of the present application, Applicants respectfully request that an Examiner interview be scheduled and conducted. In accordance with such interview request, Applicants respectfully request that the Examiner, after review of the present Amendment, contact the undersigned local Washington, D.C. area attorney at the local Washington, D.C. telephone number (703) 312-6600 for scheduling an Examiner interview, or alternatively, refrain from issuing a further action in the above-identified application as the undersigned attorneys will be telephoning the Examiner shortly after the filing date of this Amendment in order to schedule an Examiner interview. Applicants thank the Examiner in advance for such considerations. In the event that this Amendment, in and of itself, is sufficient to place the application in condition for allowance, no Examiner interview may be necessary.

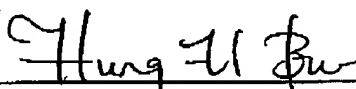
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To the extent necessary, Applicants petition for an extension of time under 37 CFR §1.136. Please charge any shortage of fees due in connection with the filing of this paper, including extension of time fees, to the Deposit Account of Antonelli, Terry, Stout & Kraus, No. 01-2135 (Application No. 500.39005X00), and please credit any excess fees to said deposit account.

Respectfully submitted,

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